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Lubricating Oil Emulsion as a Control for Scale Insects

Lubricating oil emulsions were developed by the Federal Department of Agriculture for use in control of scale insects on citrus trees. Lately, after some modification they have been used successfully by Mid-west deciduous fruit growers in scale control.

Lubricating oils having a volatility at 110° C. for 4 hours of not over 2 per cent, viscosity at 100° F. from 90 to 250 seconds (Saybolt test), and specific gravity at 20° C. of from 0.87 to 0.93 give best results. Several proportions for the emulsion are in use. The following has given good results:

Light grade lubricating oil	1 gallon
Water	1 quart
Potash fish-oil soap or potash vegetable-oil soap	1 to 2 pounds

The exact amount of soap will depend on the hardness of the water. More is needed in hard water.

The oil, water and soap are placed in a kettle or other receptacle and heated until the contents come to a boil. A brown scum appears on the surface of the mixture as it first begins to boil. After boiling for a few minutes the scum begins to disappear. Just at this stage, remove the kettle from the fire and pump the hot mixture back into itself twice under 80 to 200 pounds pressure. A pump must be used to make the emulsion, stirring will do no good. A small bucket pump is quite satisfactory for small lots. This stock emulsion contains 80 per cent oil. To make a two per cent oil, use five gallons of stock in each 200 gallons tank of spray. Water used in diluting the stock must be soft. If only hard water is available soften by adding one pound of lye to each 100 gallons before the stock solution is added.

Workers in Missouri have developed a formula in which the soap is replaced by "Kayso" or calcium caseinate as follows:

Engine oil	2 gallons
Water	1 gallon
Kayso	4 ounces

The Kayso is placed in solution by slowly sifting into the water, the latter being stirred meanwhile. The oil is then added and the mixture pumped back into itself for about three minutes. No heat is needed in making this emulsion and hard water may be used in making the dilution. Use six gallons of this stock to each 200 gallon tank of spray.

Time of application. The application may be any time during the dormant season when the temperature is above 45° F. and the day is bright. If the temperature is near 45° F. spraying should be discontinued in the early afternoon to escape possible temperature drop of the evening. Temperature near freezing separates the oil from the emulsion and damage to the trees will result.

Keep oil emulsions entirely free from lime sulfur. Be sure to clean hose and tank before using an oil emulsion.